Working Memory & Processing Speed in the Classroom

Spencer County Middle School

October 4, 2010

Jackie Risden-Smith, DoSE

What's important about Working Memory and Processing Speed?

Problems in WM and/or PS:

…are often part of the reason children struggle in school

…are often seen in *Twice Exceptional* students

…cause troubles at home

…impact children's relationships.

…often define children's feelings about themselves.

Goals for Today's Mini-Presentation

- To demonstrate how Working Memory (WM) and Processing Speed (PS) impact students.
- To discuss instructional strategies to address WM and PS problems in the classroom.

- What's important about Working Memory and Processing Speed?
- In school, WM and PS impact alertness, learning, expression, social adjustment, academic identity, emotional comfort, etc.
- At home, WM and PS impact homework, chores, relationships, recreation (sports and games), self concept, etc.

Basic Definitions (WISC-IV)

Working Memory Index

- The WMI assesses the ability to hold new information in short-term memory, concentrate, and manipulate that information to produce some result or reasoning processes.
- It is important in higher-order thinking, learning, and achievement. It can tap concentration, planning ability, cognitive flexibility, and sequencing skill, but is sensitive to anxiety too. It is an important component of learning and achievement, and ability to self-monitor.

Basic Definitions (WISC-IV)

Processing Speed Index

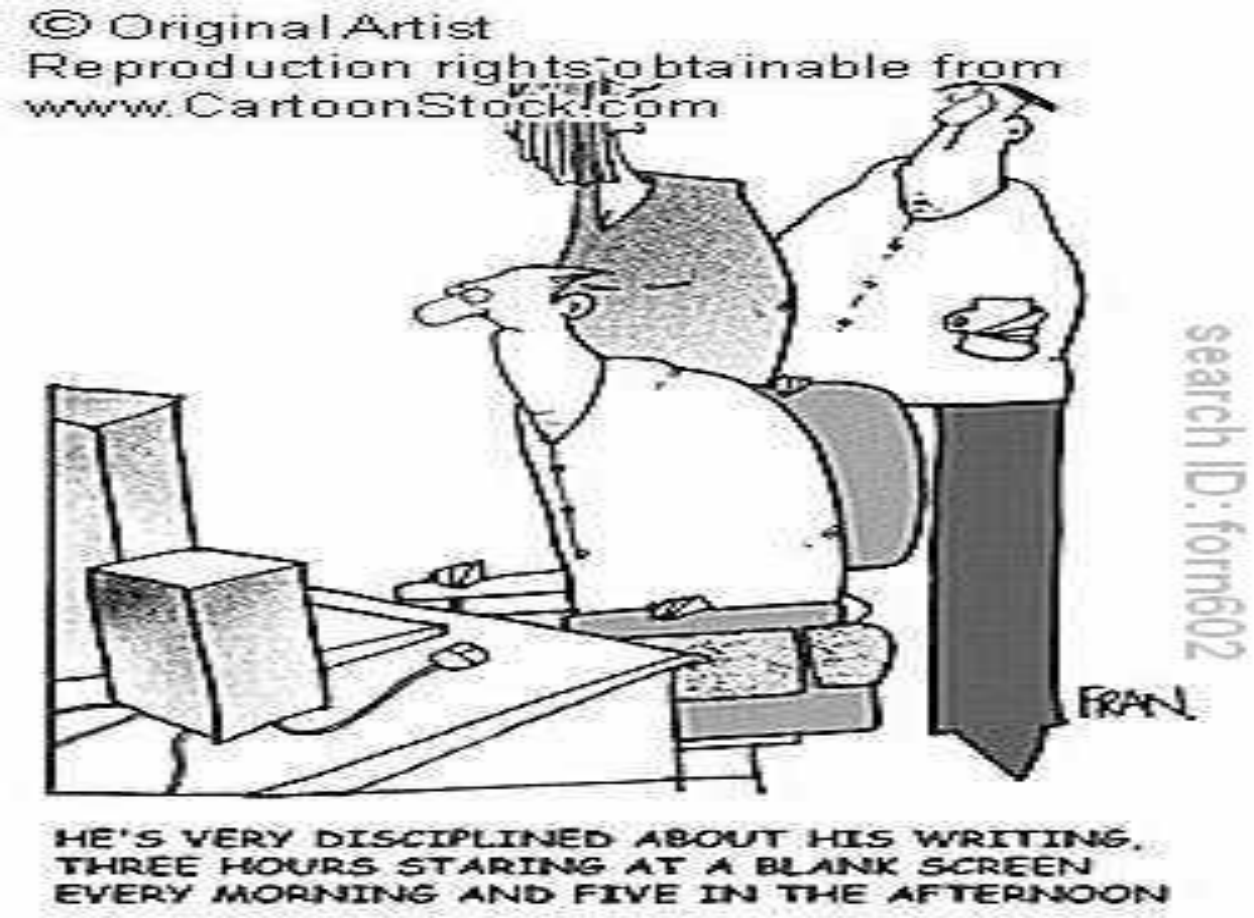
- The PSI assesses the abilities to focus attention and quickly scan, discriminate between, and sequentially order visual information. It requires persistence and planning ability, but is sensitive to motivation, difficulty working under a time pressure, and motor coordination. It is related to reading performance and development. It is related to Working Memory, in that increased processing speed can decrease the load placed on working memory, while decreased processing speed can impair the effectiveness of Working Memory.

Learning differences can occur in….

Input Central Processing Output

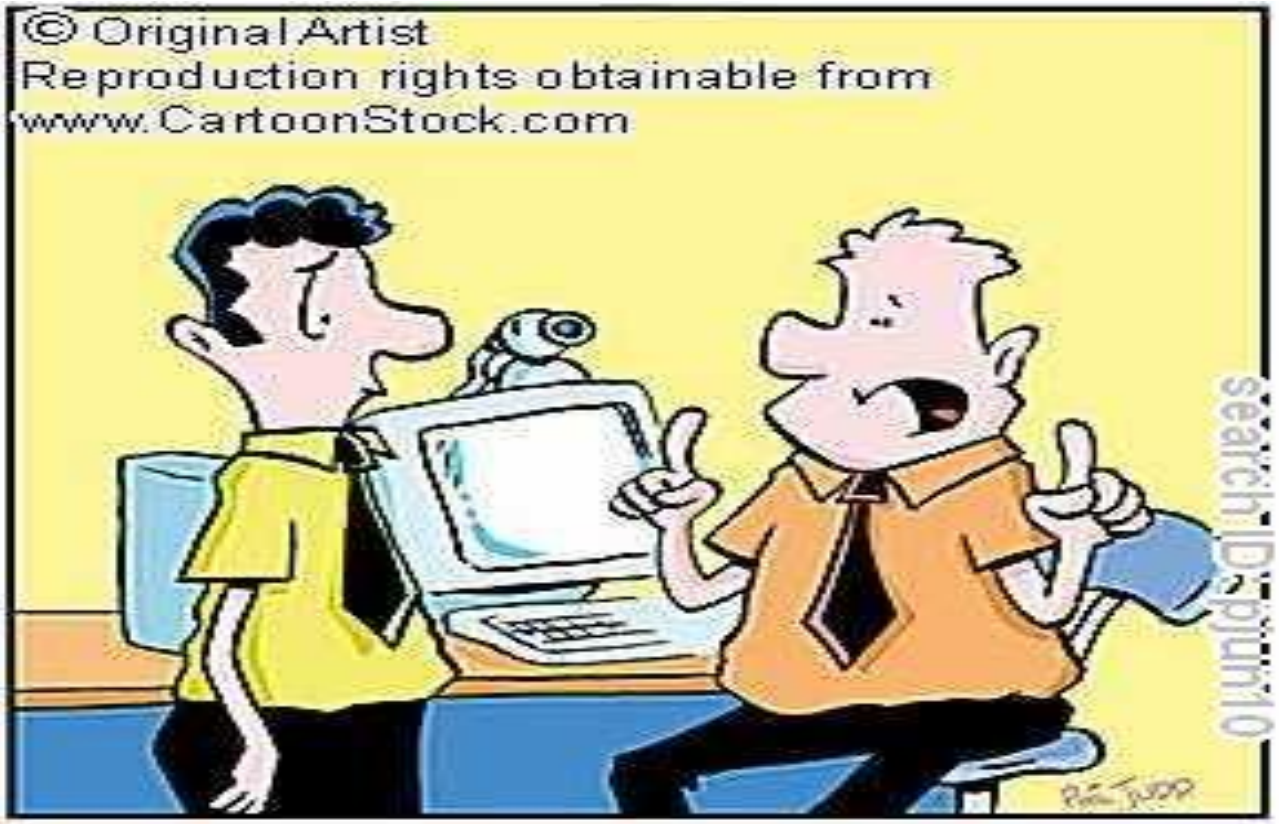
Input

- Processing Speed may be hampered due to trouble activating



Output

Oral expression, motor expression



"This computer has a fast modem, the latest Pentium, increased RAM, a huge hard drive and broadband net connections. Only one problem...slow pointer fingers."

Addressing Processing Speed Problems

Determine source of problems…

If it's an activation problem, is it due to…?

- Emotional Factors ("It's too much…"): provide encouragement, support, help getting started, etc.
- Cognitive Factors ("I don't even know where to begin."): develop a plan, break it down, use graphic organizers, etc.)

Addressing Processing Speed Problems

If there are focus/attention problems:

- Reduce distractions, provide white noise, recognize on task behavior, prompt student when she drifts, provide incentives for completion of work, etc
- If there are working memory problems: Provide templates, word banks, encourage questions, provide gentle reminders, prompts and cues.

Addressing Processing Speed Problems

If there are activity interferences:

- Provide opportunities for movement, fidget objects, gum chewing/candy sucking, etc

Addressing Working Memory & Processing Speed in the Classroom

- Increase time to complete tests
- Eliminate unnecessary, clerical task elements (e.g., make use of brief responses)
- Mad Math Minute makes some students “mad”
- Reduce number of tasks necessary to evidence competence
- Monitor time spent on homework – adjust as necessary

Addressing Working Memory & Processing Speed in the Classroom

- Multiple modalities, including art and simulations when presenting directions, explanations, and instructional content
- Multiple intelligences approach
- Materials that are meaningful to students
- Copies of the information that highlight key facts

Addressing Working Memory & Processing Speed in the Classroom

- Students repeat directions or information back to teacher
- Remind students to repeat information to themselves in their head.
- Develop a cue system with student
- Teacher repeats information or directions
- When giving directions, the teacher speaks slower and allows a pause between sentences.
- Students recall important details at the end of a lesson or period of time

Addressing Working Memory & Processing Speed in the Classroom

- Students sequence activities after a lesson or event
- Students teach information to other students
- Students deliver the schedule of events to other students
- Teacher delivers directions, explanations, and instructional content in a clear manner and at an appropriate pace
- Teacher provides students with environmental cues and prompts such as posted rules and steps for performing tasks

Addressing Working Memory & Processing Speed in the Classroom

- Teacher provides students with written list of materials and directions
- Students use resources in the environment to recall information (notes, textbooks, pictures, etc.)
- Teacher gives auditory and visual cues to help students recall information
- Teacher relates information presented to students' previous experiences
- Teacher emphasizes key concepts

Addressing Working Memory & Processing Speed in the Classroom

- Teacher reviews prior lesson's key concepts and vocabulary before moving on
- Students outline, highlight, underline, or summarize information that should be remembered
- Teacher provides adequate opportunities for repetition of information through different experiences and modalities
- Teacher provides students with information from a variety of sources
- Teacher tells students what to listen for when being given directions or receiving information
- Students use advanced organizers
- Teacher uses visual imagery

Addressing Working Memory & Processing Speed in the Classroom

- Teach students to use associative cues or mnemonic devices (PEMDAS)
- Teach students to transform information from one modality to another (e.g., From verbal to a diagram or from visual to verbal)
- Teach students to question any directions, explanations, and instructions they do not understand
- Teach students to deliver increasingly long verbal messages
- Teach students how to organize information into smaller units
- Teach note taking and outlining

Addressing Working Memory & Processing Speed in the Classroom

- Teach students how to highlight and summarize information
- Teach students a routine for beginning a task
- Teach students how to recognize key words
- Teach students to use resources in the environment to recall information (notes, textbooks, pictures, etc.)
- Teach students study and test-taking skills
- Teach students to practice memory skills by engaging in activities that are purposeful such as delivering messages or being in charge of a classroom task

Addressing Working Memory & Processing Speed in the Classroom

- Teach students to practice repetition of information
- Teach students to engage in memory games and activities
- Teach students categories
- Teach listening skills
- Teach students how to use organizers such as lists, tables, and graphics
- Teach visual imagery
- Teach students systematic ways to store and retrieve information

Addressing Working Memory & Processing Speed in the Classroom

- Teach students to practice repetition of information
- Teach students to engage in memory games and activities
- Teach students categories
- Teach listening skills
- Teach students how to use organizers such as lists, tables, and graphics
- Teach visual imagery
- Teach students systematic ways to store and retrieve information

- Information for PowerPoint taken from www.iaddvantage.com